

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

MARTIN KELLER, et al.

Application No.: Not yet assigned

Filed: Herewith

For: METHOD FOR OPERATING A  
FUEL CELL BATTERY

PRELIMINARY AMENDMENT

San Francisco, CA 94111  
September 21, 2001

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to the examination of the above-referenced application, please enter the following amendments and remarks.

IN THE ABSTRACT:

Please substitute the following amended, clean version of the Abstract (a marked-up version of the changes to the Abstract is attached to this Amendment):

METHOD FOR OPERATING A FUEL CELL BATTERY

ABSTRACT OF THE DISCLOSURE

The method for operating a fuel cell battery (1) comprises an analysis of an integrity state of the battery. This integrity state is determined by means of measurement of operating parameters and a programmed evaluation of the measurement data. The battery is controlled for the purpose of reliable operation in such a manner that the maximum electrical output power is subjected to a limitation which is dependent on the integrity state or an interruption of the operation is initiated. The integrity state can be characterized by at least two parameters, in particular a parameter pair  $c_j$ ,  $d_j$ . From a relationship which contains the parameters an internal electrical resistance ( $R_i$ ) of the battery can be calculated on the one hand and a statement on the quality of the battery can be derived on the other hand.

IN THE CLAIMS:

Please substitute the following amended, clean versions of the indicated claims (a marked-up version of the changes to the claims is attached to this Amendment):

3. (amended) Method in accordance with claim 1, characterized in that a mathematical relationship (II) exists between the internal resistance ( $R_i$ ) and an amount of fuel (QF) which is fed into the battery; and in that the parameters  $c_j$ ,  $d_j$  enter into this relationship as proportionality factor or as exponent respectively.

4. (amended) Method in accordance with claim 1, characterized in that current values of the parameter pair  $c_j$ ,  $d_j$  are determined by means of periodically carried out diagnostic measurements and by carrying out digital computations ( $IV - X''$ ); and in that as a result of these values the control of the battery is adapted where appropriate; or in that, depending on the integrity state, a message is displayed that a replacement of the fuel cells is required.

7. (amended) Method in accordance with claim 2, characterized in that the monitoring of the afterburning is carried out by means of a thermo-generator (31).

8. (amended) Method in accordance with claim 2, characterized in that the monitoring of the afterburning is carried out by means of a UV probe (31) or an ionization measurement.

9. (amended) Method in accordance with claim 2, characterized in that the monitoring of the afterburning is carried out by means of a CO sensor which is arranged in the exhaust gas flow.

10. (amended) Plant with a fuel cell battery (1), in which the method in accordance with claim 1 is used, characterized by a control device (8) and an adaptation device (10) for carrying out the method.

REMARKS:

Claims 1-10 are pending.

Amendment is made to delete a minor informality in the Abstract and to eliminate all multiple dependencies from the claims, thereby avoiding the need to pay the multiple dependent surcharge.

Respectfully submitted,



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FOI 260-08509550

**MARKED-UP VERSION OF THE CHANGES TO THE ABSTRACT**

Abstract of disclosure:

The method for operating a fuel cell battery (1) comprises an analysis of an integrity state of the battery. This integrity state is determined by means of measurement of operating parameters and a programmed evaluation of the measurement data. The battery is controlled for the purpose of reliable operation in such a manner that the maximum electrical output power is subjected to a limitation which is dependent on the integrity state or an interruption of the operation is initiated. The integrity state can be characterized by at least two parameters, in particular a parameter pair  $c_j$ ,  $d_j$ . From a relationship which contains the parameters an internal electrical resistance ( $R_i$ ) of the battery can be calculated on the one hand and a statement on the quality of the battery can be derived on the other hand.

[[Fig. 2]]

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4. (amended) Method in accordance with [any one of the claims 1 to 3] claim 1, characterized in that current values of the parameter pair  $c_j$ ,  $d_j$  are determined by means of periodically carried out diagnostic measurements and by carrying out digital computations ( $IV - X$ "); and in that as a result of these values the control of the battery is adapted where appropriate; or in that, depending on the integrity state, a message is displayed that a replacement of the fuel cells is required.

8. (amended) Method in accordance with [any one of the claims 2 to 6] claim 2, characterized in that the monitoring of the afterburning is carried out by means of a UV probe (31) or an ionization measurement.

10. (amended) Plant with a fuel cell battery (1), in which the method in accordance with [any one of the claims 1 to 9] claim 1 is used, characterized by a control device (8) and an adaptation device (10) for carrying out the method.